Auburn University Canine Detection
Research, Development, and Training Program

Auburn University's Canine and Detection Research Institute (CDRI) mission is to conduct research, development, and training activities to enhance canine and other substance detection technologies. These activities focus on the detection of hazardous materials to protect people and critical national infrastructure. Auburn has provided basic research, technological development, and education to the detector dog community for the last 15 years.

Auburn has conducted more than 15 federally funded multi-component research projects ranging from behavioral laboratory assessment of canine olfactory sensitivity and odor detection signature analysis to a year-long applied examination of the effective working duty-cycle of detector dogs under different environmental conditions. The performance of prototype detection instrumentation has been examined using the Institutes behavioral laboratory preparation for studying olfaction, which is the only time the performance of such devices has been examined in a manner allowing direct comparison to the olfactory sensitivity of a dog. Auburn is the U. S. Government's primary source of research related to canine detection and information from this research established the scientific precedent supporting the use of detector dogs for the detection of explosive and other hazardous materials. Furthermore, the Institute is a primary source of information and problem solving for the detector dog community responding to 100 or more e-mail, phone, and mail request for information or guidance regarding the use of detector dogs each year.

Auburn established the Canine Detection Training Center at Ft. McClellan, AL to further the technology transfer and training components of the Institute's mission. The Center trains dogs, handlers, trainers, and program managers in the performance of all facets of canine detection work. A unique aspect of the Center is that it provides an operational context in which applied research is conducted and, in turn, results from that research are incorporated into training programs forming a continuous loop of quality and capability enhancement. Instruction at the center blends the craftsmanship of expert canine training professionals, behavioral and veterinary sciences, and the most recent technological advances.

Auburn and the Transportation Security Administration, Explosive Detection Dog program, are the only two U.S. satellites of the highly successful Australian Customs Service Detector Dog Breeding Program and Auburn is the only non-federal government and academic veterinary science satellite of this program. This program selectively breeds dogs to be successful at detection work to enhance the quality of detector dogs and ensure a resource for such dogs amidst increased demand and ever more consolidated sources for working dogs, which is typically north-western Europe. Auburn has produced 21 litters of Labrador Retriever Puppies from which more than 50 successfully trained detector dogs have been paired with law enforcement handlers. This program is made possible through the support dozens of volunteers to house, care for, and provide these puppies with particular experiences to enhance their trainability. Recent collaborations with correctional institutions to employ low-risk inmates for raising of puppies make this program capable of very rapid expansion should demand warrant.

The Labrador Retriever breed makes for an excellent detector dog, is adaptable to many applications, and is generally perceived as non-threatening by the public. The center also has established relationships with domestic and international vendors of the highest quality working dogs to fulfill the mission specific needs of any canine detection scenario.

Auburn's program is the only detector dog and handler training with the combination of direct support from a college of veterinary medicine, behavioral science - based research and development activity and academic instructional design. The Auburn Canine Program is a unique, full service, state the art provider of canine detection research, development, training, and technology transfer. Program staff and resources provide the capabilities, technical expertise, and experience to address a myriad of canine detection challenges. Our guiding principals are a commitment to scientific understanding, quality, and responsiveness to the needs of practitioners.

Ft. McClellan provides ideal infrastructure, location, and logistical partners for the mission of Auburn's Canine Program. Auburn has a 99-year lease of several buildings and over 250 acres of land on the recently closed Army post. Include are the previous post veterinary clinic and a relatively new 24,000 square foot instructional building. Additionally, the University has constructed a 40-run kennel/breeding complex. McClellan contains several firing ranges, a driving course, airstrip, warehouses, multi-use buildings, and extensive personnel housing capacity typical of a large military training facility. Ample infrastructure is available to ramp-up to any conceivable level of training operations. Located between Atlanta and Birmingham and within 15 minutes of Interstate 20, McClellan is readily accessible. A collaborative atmosphere exists among the AU Canine Program, the ODP - Center for Domestic Preparedness and the FEMA - Noble Training Hospital in executing their respective Homeland Security Support missions making McClellan an ideal integrated hub for homeland defense/emergency preparedness training and technology development.

Paul Waggoner is the overall director of the Auburn Canine Research and Training Programs. Paul has a doctoral degree in behavioral science and 15-years of experience in conducting research and development related to canine olfaction, detector dog training, handler instruction, and operational deployment of detector dogs. Thomas (Ed) Hawkinson is director of Training Activities. Ed's experience includes managing the U. S. Secret Service Canine Program, Military Working Dog Program Operations Branch Chief and Senior Canine Instructor, and tours of duty as a Military Police Canine Handler and Kennel Master in Korea and Vietnam. John Pearce is the deputy director of training activities. John's previous position was with the Military Working Dog Training Center assigned as branch chief for the TSA Canine Training Program. These two individuals have a myriad of experiences in training dogs, handlers, trainers, and supervisors as well as in employing canine detection for both military and law enforcement applications. Hawkinson and Pearce have recruited an eclectic ensemble of canine training / handler instructional staff with varied law enforcement, federal agency, and private investigation backgrounds. For example, staff member Jeanne Brock holds two masters degrees, is a certified veterinary technician, was proprietor of a canine training and canine arson / cadaver private investigation firm and is currently the President of the Canine Arson Detection Association. Auburn has over 200 person-years of experience in canine detection.

Auburn has attracted instructors that are leaders in the field of canine detection who share the vision of applying behavioral science and canine training craftsmanship to enhance the practice of canine detection. Auburn's canine training methods are based on the well-established principles of animal learning from academic behavioral science. Handlers are required to demonstrate mastery of over 80-hours of classroom instruction in our standard explosive and drug detection courses. The classroom instruction is comprehensive providing handlers with information ranging from health and sanitation of kennels to operational tactics; however, instruction in basic behavioral principles and the use of the correct behavioral terminology in the course is uniquely intensive. To date, canine detection has been practiced at more of a craft level than a technology. The purpose in our focusing on teaching handlers basic behavioral principles and its associated technical language is to move canine detection in the direction of a technology. Handlers equipped with a basic understanding of behavioral principles and consistent technical language are better armed to maintain the performance of their dog and communicate meaningfully with their colleagues and instructors in diagnosing and correcting performance problems. Our explosive detection course is 10-weeks long and our drug detection course is 6-weeks long. Both include extensive training in operational environments and conclude with realistic scenario based evaluations and video–taped certification of operational competence.

Auburn welcomes and supports the establishment of national best practice guidelines for training, evaluation, certification, and operational practices in canine detection. Best practice guidelines are critically needed to reduce the extreme variability in the quality with which canine detection is practiced. Such guidelines will also provide a common set of technical and operational terms to aid communication across practitioners. Perhaps the most immediate importance of such guidelines is to make it possible for the Department of Homeland Security to identify and maintain a database of canine detection teams and their specific operational capabilities for effective utilization of local, regional, and federal canine detection resources in response to terrorist threat situations and critical incidents. Such guidelines must accommodate the diverse operational missions of different agencies. Therefore, we prefer the concept of guidelines, which may provide the basis for "standards" promulgated by a specific segment of the responder community or certification of an agency of the Federal Government to conduct particular tasks, as opposed to overarching "national standards or certifications" to which all applications under all circumstances must comply. Auburn has encouraged the development of the *Scientific Working Group on Dog and Orthogonal Detectors (SWG DOG)*, which had its first meeting this month. This scientific working group (SWG) follows in the tradition of other successful working groups sponsored by the Department of Justice, such as the "SWG on DNA Evidence" and "SWG on Finger Printing" as well as the "Bomb Squad Commander's EOD Technician Training Guidelines". Auburn was honored to have 3 members (more than any other agency or institution) chosen to serve on the 55 member SWG DOG committee: Paul Waggoner (Unification of Terms and Research & Technology sub-committees); Robert Gillette (Breeding and Dog Care & Physical Conditioning) and; John Pearce (SWG Executive Committee Member, Chair of the Handler Selection & Training sub-committee, and Certification Procedures sub-committee)

Instruction of handlers at the Training Center is also enhanced by affiliated subject matter experts at the University. For example, instruction regarding canine health, fitness, feeding, housing, and first aid is under the guidance of Robert Gillette, Professor of Veterinary Medicine

and Director of the Sports Medicine Center within Auburn University's College of Veterinary Medicine. Dr. Gillette also serves as the primary veterinary consultant to the Center's detector dog breeding activities. Auburn's program is also unique in that its operational training program is monitored internally by an Institutional Animal Care and Use Committee and externally by the U. S. Department of Agricultural as mandated for University's by the Animal Welfare Act. Our R&D, training, and breeding activities the approval of and our housing and veterinary care of dogs is overseen by the Auburn University Institutional Animal Care and Use Committee and is monitored for compliance with the Animal Welfare Act by the U.S. Department of Agriculture.

The varied experiences of Auburn's Canine Program staff and R&D support allow the Auburn program to rapidly develop new applications for canine detection. For example, the AU Canine program conducted research, developed training procedures, and supported the Department of Energy in fielding the first ever operational chemical warfare agent detector dog teams. Our current development and prototyping efforts focus on applications of immediate relevance to homeland security and force protection. One of these is person-screening for explosive material particularly in the mass transit theater. The appropriately prepared dog and handler team can effectively screen large numbers of persons and their carried items entering or exiting a mass transit theatre with little to no retarding of the flow of transit users, which is a significant concern regarding instrumental detection devices. Additionally, extensive observation of an Auburn trained operational detector dog person-screening team in the Metro Atlanta Transit system across the last 6-months suggests that very few people consider screening activities by a Labrador Retriever handled by a uniformed Transit Authority officer to be threatening or intrusive. Other applications being prototyped involve several remote and relatively autonomous detector dog operations. For example, remote screening of vehicles and their occupants by dogs with the handler or operator being hundreds of yards in distance from the vehicle provides a safer stand-off distance for officers in the case vehicle check points. We are also collaborating with AU Engineering in developing inertia enhanced global positioning systems and remote command issuing / reporting equipment with which to equip dogs for non line-of-sight applications such as building searches, search and rescue, long-range autonomous tracking of persons and surveillance for intruders along perimeters of critical infrastructure and for border protection. In such remote and autonomous applications, the dog can also serve as a highly mobile and adaptively directed platform for sensors, cameras, and listening devices. Auburns canine program's ability to engineer the behavior of dogs for such applications has the potential to provide for many innovative applications for dogs that support homeland security and force protection.

In addition to serving as a conduit for technology transfer to the detector dog user community and a vehicle for infusing established behavioral science into the craft of detector dog training and use, part of the vision of the Training Center was to provide a needed resource for high-level detector dog team (i.e., dog and handler) instruction to state, local, and private law enforcement / security agencies as well as federal agencies that did not have inherent training programs. Furthermore, as a program with no operational mandate, an eclectic instructional staff, and R&D capabilities, to provide a resource for specialized mission curriculum development and novel applications of canine detection. To that end, our customers to date have included the following:

U.S. Department of Energy and Wackenhut Services: Chemical warfare agent R&D, proof of concept canine training and testing, handler instruction, and operational deployment support

U. S. Customs Service: Technical support of prototype chemical agent detection training program on –site at McClellan.

U.S. Coast Guard Office of Law Enforcement: Designed maritime operations curriculum and training program, trained first 10 new USCG service-wide unified canine program detector dog teams, assisted in development of USCG Policy and Procedures for detector dog program and performed after-deployment evaluation and program guidance.

U. S. Secret Service Technical Services Division: Trained prototype explosive detection person-screening dog and conducted test and demonstration of person-screening capability

Metro Atlanta Transit Authority: Developed curriculum and training procedures specifically for screening persons and their hand-carried items for explosive material in a mass transit theatre of operation. Have trained 2 person-screening detection teams for MARTS and anticipate the training of 2 additional teams

Federal Protective Service, DHS: Developed specialized curriculum and training program. Over 50 Federal Protective Service detector dog teams have been trained to date. Re-evaluation and re-certification of nearly half of those teams has also occurred.

Australian Customs Service: Trained two chemical warfare agent teams and consulted in development of Australian Customs Service firearms detection training program.

Customs Service of the Territory of the Mariana Islands: Trained their first and only 4 explosive detector dog teams

Local Law Enforcement: Trained several local law enforcement explosive and drug detector dog teams. In all but one case, this training and dogs has been done for free or significantly subsidized by Auburn University

Private Security Firms: Have provided trained dogs and other services to two of the Nations preeminent private detector dog services: Explosive Countermeasures Inc., which has several Government (e.g. IRS, Holocaust Museum) and DOD (e.g., Pentagon Perimeter Security) contracts: Wackenhut Services DOE Security Operations and K-9 Search on Site, both of which provide detector dog services for DOE National Laboratory Sites (e.g., Savannah River, Oak Ridge, Sandia, Los Alamos).

Several of our graduate detector dog teams have excelled in their operational missions. For example, two AU trained USCG teams from Seattle have assisted the ATF and local law enforcement in recovery of bombing making materials on two separate occasions by finding materials not able to located by physical searches. All of the 7 local area law enforcement drug detection teams we have trained have had multiple significant finds of illegal drugs. One of our FPS trained teams interdicted prohibited propellant (concrete nail gun ammunition – smokeless

powder) material in the trunk of a vehicle during routine vehicle screening at the entrance to a Government building parking garage in D.C.

Despite these success and advances, maintaining both R&D and Training Center capabilities have been a challenge for Auburn University financially due to insufficient volume and consistency of R&D and training service income. Auburn has endeavored to provide a critically needed resource for enhancing canine detection to support homeland security. Attention to enhancing canine detection resources, capabilities and innovative uses of canine detection has been disproportionately low given its immediate potential to support homeland security particularly in relation to the to the extensive attention and associated funding allotted to the development and fielding of instrumental detection devices. In particular, state and local law enforcement are unable to afford services at the level offered by Auburn or most other credible training services, thus canine detection, the most readily available tool for their use in detection, is relegated to lowest bidder; and subsequent to 9/11 the number of such low bidders expanded significantly. The cost of training a standard explosive detection team (including provision of a dog) at Auburn is currently $13,800 not including lodging and per-diem for the trainee. Some of our Government contracts require certain guarantees on dog health and performance, as well as additional elements of training that increase our typical costs for Federal customers to over $14,000. Drug detection team training cost $12,800. This price schedule reflects Auburn's actual cost for performing this work including all the overhead, maintenance at McClellan and administration. In order to impact the practice of canine detection at the level of state and local law enforcement, Auburn has subsidized detection team training for state and local law enforcement by 10%; 20% for law enforcement agencies in Alabama.

We offer high quality training at a relatively low price because of Auburn's requisite non-profit business model as a State, Land-Grant University. In comparing these prices to quotes of training costs at Federal Agencies, it is important to consider whether agency quotes truly reflect the extant overhead expenses required to conduct their canine program including administrative costs. It is our opinion that any equal comparison will necessarily support our contention that our prices are very modest for the level of training and quality of facilities provided.

Auburn currently can train about 36-detection teams per year. Owing to nearly 100% retention of previous customers for re-evaluation, re-certification, canine program manager seminar attendees, and additional canine team training, we are nearing maximum utilization of this capacity, thus reducing our present ability to take on new customers for our service. Auburn University has invested on the order of $5 Million of non-federal funds to provide for personnel support and infrastructure development to reach this current capacity. However, Auburn has the institutional capacity to rapidly ramp up personnel and facility resources at McClellan to accommodate at least double that capacity within 6-months or less given external support.

Despite significant advances in electronic sensors, the use of detection dogs is widely regarded as the most capable tool for the interdiction of hazardous materials such as explosives (1993, Office of Technology Assessment, U.S. Congress). Dogs are known to be capable of detecting concentrations of an odor at least as low as 1-part per 100 trillion parts of clean air, which exceeds the capability of most operational chemical detection devices. Moreover, canines possess amazing olfactory acuity, are capable of operating in "odor-noisy" environments (i.e.,

capabilities are not easily perturbed by extraneous odors), and provide for interrogation of articles and large areas with rapidity unmatched by any other method of detection. Thus, well-trained detector dog and handler teams are vital for safeguarding the Nation against terrorism. However, canine detection is underutilized because of a limited number of competent training programs, a limited supply of high-quality dogs, and sparse funding of canine detection research and development. Auburn University's Canine Detection Program is uniquely capable and positioned to provide an asset responsive to all of these needs.